

CLAIMS

What is claimed is:

1. 1. A stent comprising:
 2. a stent member; and
 3. an insoluble fibrous component, wherein the component is sufficiently loosely wrapped around the stent to allow the component to deform in a manner that forms a reinforcing thrombus plug.
1. 2. The stent of claim 1, wherein the insoluble fibrous component comprises at least one nanofiber.
1. 3. The stent of claim 1, wherein the insoluble fibrous component comprises a compound selected from the group consisting of poly(caprolactone), polyethylene terephthalate, fibrinogen, polyolefins, polyethylene, polypropylene, linear poly(ethylenimine), cellulose acetate, grafted celluloses, poly (L-lactic acid), poly (ethyleneoxide), poly (hydroxyethylmethacrylate), poly (glycolic acid) poly vinylpyrrolidone, polyethylene glycol, polyethylene oxazoline, polyester, polyacrylic acid, polyacrylic acid esters, polyphosphazines, polycyanoacrylate, polyvinyl amines, polyethylene imines, polyethylene amines, polyacrylamides, cellulose, polyorthoesters, polyanhydrides, polyketals, polyacetals, polyureas, and polycarbonate.
1. 4. The stent of claim 1, wherein the insoluble fibrous component comprises a thrombogenic material that initiates the formation of a thrombus.
1. 5. The stent of claim 4, wherein the thrombogenic material at least partially blocks the entrance to a structure selected from the group consisting of an aneurysm, a fistula, and an opening in a blood vessel wall.
1. 6. A method for manufacturing a stent comprising the steps of:
 2. coating a stent with a release layer; and

coating the release layer with an insoluble fibrous layer, wherein the release layer is capable of being degraded leaving the insoluble fibrous layer sufficiently loosely wrapped around the stent to allow the insoluble fibrous layer to deform and move in a manner that allows it to form a reinforcing plug.

1 7. The method of claim 6, wherein the release layer is soluble in blood the fibrous
2 layer is insoluble in blood.

1 8. The method of claim 6, wherein the release layer is capable of being digested by
2 enzymes.

1 9. The method of claim 6, wherein the release layer comprises a material selected from
2 the group consisting of polysaccharides, corn syrup, gelatin, collagen, peptides,
3 proteins, nucleic acids, and ribonucleic acids.

1 10. The method of claim 6, wherein the insoluble fibrous layer comprises a
2 thrombogenic material.

1 11. The method of claim 10, wherein the thrombogenic material is selected from the
2 group consisting of poly(caprolactone), polyethylene terephthalate, fibrinogen,
3 polyolefins, polyethylene, polypropylene, linear poly(ethylenimine), cellulose
4 acetate, grafted cellulosics, poly (L-lactic acid), poly (ethyleneoxide), poly
5 (hydroxyethylmethacrylate), poly (glycolic acid) poly vinylpyrrolidone,
6 polyethylene glycol, polyethylene oxazoline, polyester, polyacrylic acid, polyacrylic
7 acid esters, polyphosphazines, polycyanoacrylate, polyvinyl amines, polyethylene
8 imines, polyethylene amines, polyacrylamides, cellulose, polyorthoesters,
9 polyanhydrides, polyketals, polyacetals, polyureas, and polycarbonate.

1 12. The method of claim 6, wherein the release layer comprises a nanofiber.

1 13. The method of claim 6, wherein the insoluble fibrous layer comprises a nanofiber.

- 1 14. The method of claim 6, wherein the steps of coating the stent comprises
2 electrospinning.
- 1 15. The method of claim 6, wherein the step of coating the release layer with an
2 insoluble fibrous layer comprises electrospinning.
- 1 16. A method for using the stent of claim 1 comprising the step of implanting the stent in
2 a living organism.
- 1 17. A balloon catheter comprising:
2 an insoluble fibrous layer, wherein the layer is capable of becoming loosely
3 wrapped around the balloon catheter upon degradation of a release component.
- 1 18. The balloon catheter of claim 17, wherein the insoluble fibrous layer comprises a
2 nanofiber.
- 1 19. The balloon catheter of claim 17, wherein the external fibrous layer comprises
2 polyethyleneoxide, polyethylene glycol, polyethylene oxazoline, polyester,
3 polycaprolactone, polyacrylic acid, polyacrylic acid esters,
4 polyhydroxyethylmethacrylate, polyvinyl pyrrolidone, polyphosphazines,
5 polycyanoacrylate, polyvinyl amines, polyethylene imines, polyethylene amines,
6 polyacrylamides, cellulose, cellulose derivatives, proteins, polyorthoesters,
7 polyanhydrides, polyketals, polyacetals, polyureas, and polycarbonate, or a
8 combination thereof.
- 1 20. The balloon catheter of claim 17, wherein the external layer comprises a
2 thrombogenic material that initiates the formation of a thrombus.
- 1 21. The balloon catheter of claim 20, wherein the thrombogenic material at least
2 partially blocks the entrance to an aneurysm or an opening in a blood vessel wall.

- 1 22. A method for manufacturing a balloon catheter having an external fibrous layer that
2 is loosely wrapped around the balloon catheter comprising the steps:
3 coating a balloon catheter's external surface with a release layer;
4 coating the outer surface of the release layer with a fibrous layer; and
5 removing the release layer thereby leaving the fibrous layer loosely
6 wrapped around the balloon catheter.
- 1 23. The method of claim 22, wherein the release layer is soluble and the fibrous layer is
2 insoluble in a liquid.
- 1 24. The method of claim 22, wherein the release layer can be degraded to a soluble or
2 gaseous species by enzymes, small molecules, or other reactive substances.
- 1 25. The method of claim 22, wherein the release layer comprises polyethyleneoxide, polyethylene glycol, polyethylene oxazoline, polyester, polycaprolactone, polyacrylic acid, polyacrylic acid esters, polyhydroxyethylmethacrylate, polyvinyl pyrrolidone, polyphosphazines, polycyanoacrylate, polyvinyl amines, polyethylene imines, polyethylene amines, polyacrylamides, cellulose, cellulose derivatives, proteins, polyorthoesters, polyanhydrides, polyketals, polyacetals, polyureas, and polycarbonate, or a combination thereof.
- 1 26. The method of claim 22, wherein the fibrous layer comprises a thrombogenic agent.
- 1 27. The method of claim 26, wherein the thrombogenic agent is fibrinogen, collagen, or
2 a combination thereof.
- 1 28. The method of claim 22, wherein the release layer comprises a nanofiber.
- 1 29. The method of claim 22, wherein the fibrous layer comprises a nanofiber.
- 1 30. The method of claim 22, wherein the step of coating the balloon catheter's external
2 surface comprises electrospinning.

- 1 31. The method of claim 22, wherein the step of coating the outer surface of the release
2 layer with a fibrous layer comprises electrospinning.
- 1 32. A method for using a balloon catheter having an external fibrous layer that is loosely
2 wrapped around the balloon catheter comprising the step of implanting the balloon
3 catheter in a living organism.
- 1 33. A method for manufacturing a stent comprising the steps of:
2 Simultaneously coating a stent's external surface with a release component
3 and an insoluble fibrous component, wherein the release component is capable of
4 being degraded leaving the insoluble fibrous component sufficiently loosely wrapped
5 around the stent to allow the insoluble fibrous layer to deform and move in a manner
6 that forms a reinforced thrombus plug.
- 1 34. The method of claim 33, wherein the release component is soluble and the insoluble
2 fibrous layer is insoluble in blood.
- 1 35. The method of claim 33, wherein the insoluble release layer can be degraded by
2 enzymes.
- 1 36. The method of claim 33, wherein the release layer comprises a compound selected
2 from the group consisting of polysaccharides, corn syrup, gelatin, collagen, peptides,
3 ribonucleic acids, deoxyribonucleic acids, glycogen, and glycoproteins.
- 1 37. The method of claim 33, wherein the insoluble fibrous component comprises a
2 thrombogenic material.
- 1 38. The method of claim 37, wherein the thrombogenic material is fibrinogen, collagen,
2 or a combination thereof.

- 1 39. The method of claim 33, wherein the insoluble release component comprises a
- 2 nanofiber.
- 1 40. The method of claim 33, wherein the insoluble fibrous component comprises a
- 2 nanofiber.
- 1 41. The method of claim 33, wherein the step of coating the stent comprises a method
- 2 selected from the group consisting of electrospinning and nanofibers by gas jet.
- 1 42. The method of claim 33, wherein the step of coating the release component with an
- 2 insoluble fibrous component comprises a method selected from the group consisting
- 3 of electrospinning and nanofibers by gas jet.